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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/786,258	02/25/2004	Baoguo Yang	BP3005	2710

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Robert A. McLauchlan
P.O. Box 160727
Austin, TX 78716-0727

EXAMINER	
ODOM, CURTIS B	

ART UNIT	PAPER NUMBER
2634	

DATE MAILED: 08/08/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/786,258	YANG ET AL.	
	Examiner	Art Unit	
	Curtis B. Odom	2634	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *25 February 2004*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-37* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-37* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *25 February 2004* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Specification

1. The abstract of the disclosure is objected to because in line 3 "ofone" is suggested to be changed to "of one". Correction is required. See MPEP § 608.01(b).

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

3. Claims 1-5, 8-10, 13-15, 18-22, 25-28, 31-34, and 37 are rejected under 35 U.S.C. 102(a) as being anticipated by Sundaralingam (WO 03/032593 A1), hereinafter referred to as Reference A.

Regarding claim 1, Reference A discloses a method (Fig. 2, page 2, line 17-page 3, line 20) to identify a modulation format of a data frame received from a servicing base station by a wireless terminal in a cellular wireless communication system, the method comprises:

receiving (Fig. 2, page 2, line 17-page 3, line 20, page 8, line 5-page 9, line 6, and page 10, lines 16-20) a first Radio Frequency (RF) burst of the data frame from the servicing base station, wherein the first RF burst carries a plurality of modulated symbols;

extracting (page 8, line 5-page 9, line 6 and column 10, lines 13-20) a training sequence from the first RF burst, wherein the training sequence comprises modulated symbols;

processing (Fig. 2, blocks 14, 16, 18, and 20, page 8, line 5-page 9, line 6 and column 10, lines 13-20) the training sequence assuming a first modulation format (GMSK modulation and correlation) to produce a first channel energy (page 3, lines 1-20);

processing (Fig. 2, blocks 24, 16, 18, and 20, page 8, line 5-page 9, line 6 and column 10, lines 13-20) the training sequence assuming a second modulation format (8PSK modulation and correation) to produce a second channel energy (page 3, lines 1-20);

determining (Fig. 2, block 22, page 3, lines 1-20) a greater channel energy from the first channel energy and the second channel energy; and I

identifying (Fig. 2, block 22, page 3, lines 1-20) the modulation format of the first RF burst as corresponding to the greater channel energy.

Regarding claim 2, which inherits the limitations of claim 1, Reference A discloses processing the training sequence assuming the first modulation format to produce the first channel energy further comprises derotating the symbols within the training sequence; and processing the training sequence assuming the second modulation format to produce the second channel energy further comprises derotating the symbols within the training sequence (Fig. 2, blocks 14 and 24, page 10, lines 13-20), wherein the signals are derotated by the rotation angle.

Regarding claim 3, which inherits the limitations of claim 2, Reference A discloses the first modulation format is GMSK; and the second modulation format is 8PSK (Fig. 2).

Regarding claim 4, which inherits the limitations of claim 1, Reference A discloses extracting the training sequence from the first RF burst, further comprises: processing the first

RF burst to produce a baseband signal; and extracting the training sequence from the baseband signal (page 8, lines 5-page 9, line 6), wherein the demodulation produces a baseband signal and the training sequence is extracted and stored to perform correlation to produce the channel impulse response.

Regarding claim 5, which inherits the limitations of claim 1, Reference A further discloses receiving (page 2, line 17-page 3, line 20, page 8, line 5-page 9, line 6, and page 10, lines 16-20) a subsequent RF burst within the data frame from the servicing base station, wherein the subsequent RF burst carries a plurality of modulated symbols;

processing (Fig. 2, blocks 14, 16, 18, and 20, page 8, line 5-page 9, line 6 and column 10, lines 13-20) the training sequence assuming the first modulation format to produce a subsequent first channel energy (page 3, lines 1-20);

accumulating (Fig. 2, block 18, column 9, lines 8-20) the subsequent first channel energy with the first channel energy to produce an accumulated first channel energy (accumulated tap energies);

processing (Fig. 2, blocks 24, 16, 18, and 20, page 8, line 5-page 9, line 6 and column 10, lines 13-20) the training sequence assuming the second modulation format to produce a subsequent second channel energy (column 3, lines 1-20);

accumulating (Fig. 2, block 18, column 9, lines 8-20) the subsequent second channel energy with the second channel energy to produce an accumulated second channel energy;

determining (Fig. 2, block 22, column 3, lines 1-20) a greater accumulated channel energy from the first accumulated channel energy and the second accumulated channel energy; and

identifying (Fig. 2, block 22, column 3, lines 1-20) the modulation format of the subsequent RF burst as corresponding to the greater accumulated channel energy.

Regarding claim 8, Reference A discloses a method to identify a modulation format of a data frame transmitted between a servicing base station and a wireless terminal in a cellular wireless communication system, the method comprises:

receiving (Fig. 5 and 6, page 8, line 5-page 9, line 6, and page 10, lines 16-20) a first Radio Frequency (RF) burst of the data frame from the servicing base station, wherein the first RF burst carries a plurality of modulated symbols;

extracting (Fig. 5, block 58, page 8, line 5-page 9, line 6) a training sequence from the first RF burst, wherein the training sequence comprises modulated symbols;

producing (Fig. 5, block 60, page 8, line 5-page 9, line 6) a first channel estimate based on the training sequence assuming a first modulation format (GMSK);

applying (Fig. 6, block 68, page 10, line 12-page 11, line 11) the first channel estimate to a reference training sequence of the first modulation format to produce a first reconstructed training sequence (ref);

comparing the (Fig. 6, blocks 70, 72, and 74, page 10, line 12-page 11, line 4 and page 12, lines 4-14)) training sequence to the first reconstructed training sequence to produce a first error magnitude result (noise variance);

producing (Fig. 5, block 60, page 8, line 5-page 9, line 6) a second channel estimate based on the training sequence assuming a second modulation format (8PSK);

applying (Fig. 6, block 68, page 10, line 12-page 11, line 11) the second channel estimate to a reference training sequence of the second modulation format to produce a second reconstructed training sequence;

comparing (Fig. 6, block 70, page 10, line 12-page 11, line 4 and page 12, lines 4-14) the training sequence to the second reconstructed training sequence to produce a second error magnitude result (noise variance);

identifying the modulation format of the first RF burst as the one corresponding to the smaller error magnitude (Fig. 5, block 86, page 12, lines 18-22)

Regarding claim 9, which inherits the limitations of claim 8, Reference A discloses receiving a subsequent RF burst within the data frame from the servicing base station, wherein the subsequent RF burst carries a plurality of modulated symbols;

processing (Fig. 5, block 66 and Fig. 6, page11, line 1-page 12, lines 14) the training sequence assuming the first modulation format to produce a subsequent first error magnitude;

accumulating (Fig. 5, block 64, page 12, lines 4-14) the subsequent first error magnitude with the first error magnitude to produce an accumulated first error magnitude (accumulated tap error signals);

processing (Fig. 5, block 66 and Fig. 6, page11, line 1-page 12, lines 14) the training sequence assuming the second modulation format to produce a subsequent second error magnitude;

accumulating (Fig. 5, block 64, page 12, lines 4-14) the subsequent second error magnitude with the second channel energy to produce an accumulated second error magnitude;

determining (Fig. 5, block 86, page 12, lines 18-22) a smaller accumulated error magnitude from the first accumulated error magnitude and the second accumulated error magnitude; and

identifying (Fig. 5, block 86, page 12, lines 18-22) the modulation format of the subsequent RF burst as corresponding to the smaller accumulated error magnitude.

Regarding claim 10, which inherits the limitations of claim 9, Reference A further discloses the first modulation format is GMSK; and the second modulation format is 8PSK (Fig. 5).

Regarding claims 13-15, Reference A further discloses the limitations of claims 13-15 (see claims 1-3), including the method of claims 13-15 (see claims 1-3) performed in a wireless terminal (Fig. 1, block 8 and Fig. 9, page 1, line 11-page 2, line16) that comprises an RF front end (Fig. 8, blocks 100, and 102); a baseband processor communicatively coupled to the RF front end (Fig. 8, blocks 104, 106, and 108); and a CODEC processing module communicatively coupled to the baseband processor (Fig. 8, block 110, page 2, lines 2-16), wherein the receiver is a GPRS receiver which allows coding/decoding as described herein.

Regarding claim 18, which inherits the limitations of claim 13, Reference A further discloses the wireless terminal operates according to GSM standard (page 1, line 11-page 2, line16 and page 8, lines 5-15).

Regarding claims 19-22, Reference A further discloses the limitations of claims 19-22 (see claims 1-4), including the method of claims 19-22 (see claims 1-4) performed in a wireless terminal (Fig. 1, block 8 and Fig. 9, page 1, line 11-page 2, line16) that comprises an RF front

end (Fig. 8, blocks 100, and 102); a baseband processor communicatively coupled to the RF front end (Fig. 8, blocks 104, 106, and 108).

Regarding claim 25, which inherits the limitations of claim 19, Reference A further discloses the wireless terminal operates according to GSM standard (page 1, line 11-page 2, line16 and page 8, lines 5-15).

Regarding claims 26-28, Reference A further discloses the limitations of claims 26-28 (see claims 8 and 10), including processing the first RF burst to produce a baseband signal; and extract the training sequence from the baseband signal (page 8, lines 5-page 9, line 6) wherein the method of claims 26-28 are performed in a wireless terminal (Fig. 1, block 8 and Fig. 9, page 1, line 11-page 2, line16) that comprises an RF front end (Fig. 8, blocks 100, and 102); a baseband processor communicatively coupled to the RF front end (Fig. 8, blocks 104, 106, and 108); and a CODEC processing module communicatively coupled to the baseband processor (Fig. 8, block 110, page 2, lines 2-16), wherein the receiver is a GPRS receiver which allows coding/decoding as described herein.

Regarding claim 31, which inherits the limitations of claim 26, Reference A further discloses the wireless terminal operates according to GSM standard (page 1, line 11-page 2, line16 and page 8, lines 5-15).

Regarding claims 32-34, Reference A further discloses the limitations of claims 32-34 (see claims 8 and 10), including processing the first RF burst to produce a baseband signal; and extract the training sequence from the baseband signal (page 8, lines 5-page 9, line 6) wherein the method of claims 32-34 are performed in a wireless terminal (Fig. 1, block 8 and Fig. 9, page 1, line 11-page 2, line16) that comprises an RF front end (Fig. 8, blocks 100, and 102); and a

baseband processor communicatively coupled to the RF front end (Fig. 8, blocks 104, 106, and 108).

Regarding claim 37, which inherits the limitations of claim 32, Reference A further discloses the wireless terminal operates according to GSM standard (page 1, line 11-page 2, line 16 and page 8, lines 5-15).

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

5. Claims 6, 7, 11, 12, 16, 17, 23, 24, 29, 30, 35, and 36 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sundaralingam (WO 03/032593 A1), hereinafter referred to as Reference A, in view of Khullar et al. (U. S. Patent No. 6, 400, 928).

Regarding claims 6, 7, 11, 12, 16, 17, 23, 24, 29, 30, 35, and 36, Reference A discloses all the limitations of claims 6, 7, 11, 12, 16, 17, 23, 24, 29, 30, 35, and 36 (see above rejection of claims 1-5, 8-10, 13-15, 18-22, 25-28, 31-34, and 37) except comparing the identified modulation format of the subsequent RF burst to the identified modulation format of previous RF bursts of the data frame; demodulating the subsequent RF burst according to the identified modulation format of the subsequent RF burst; and discarding the prior RF bursts of the data frame when the identified modulation format of the subsequent RF burst compares unfavorably

to the identified modulation format of prior RF bursts or reprocessing the prior RF bursts of the data frame according to the identified modulation format of the subsequent RF burst when the identified modulation format of the subsequent RF burst compares unfavorably to the identified modulation format of the prior RF burst.

Khullar et al. discloses a very similar method/apparatus for receiving RF burst and for determining a modulation scheme (GMSK or 8PSK) which includes generating channel energies (through channel estimation) and comparing the energies (highest energy to detect the modulation scheme (Fig. 4, column 8, lines 24-67). Khullar et al. also discloses comparing the identified modulation format of the subsequent RF burst to the identified modulation format of previous RF bursts of the data frame (column 9, lines 17-30); demodulating the subsequent RF burst according to the identified modulation format of the subsequent RF burst (column 9, lines 1-17); and discarding (setting soft values to zero) the prior RF bursts of the data frame when the identified modulation format of the subsequent RF burst compares unfavorably to the identified modulation format of prior RF bursts (column 9, lines 42-57) or reprocessing (converting) the prior RF bursts of the data frame according to the identified modulation format of the subsequent RF burst when the identified modulation format of the subsequent RF burst compares unfavorably to the identified modulation format of the prior RF burst (column 9, lines 17-30). Therefore, it would have been obvious to one skilled in the art at the time the invention was made to modify the method/apparatus of Reference A with the teachings of Khullar et al. in order ensure that information received from unreliable bursts (bursts which compare unfavorably to the identified modulation format of prior RF bursts) does not have an adverse effect on the subsequent signal processing (Khuller et al., column 9, lines 42-57).

Conclusion

6. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Yang (U. S. Patent No. 2004/0096012) and Lindoff et al. (U. S. Patent NO. 6, 463, 107) disclose detecting a modulation type based on channel estimation.

7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Curtis B. Odom whose telephone number is 571-272-3046. The examiner can normally be reached on Monday- Friday, 8-5.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Stephen Chin can be reached on 571-272-3056. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Curtis Odom
July 29, 2005

STEPHEN CHIN
SUPERVISORY PATENT EXAMIN
TECHNOLOGY CENTER 2600